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## CLAIMS:

- An insecticidal composition which:
- (i) is adapted for oral administration to an insect,
- (ii) comprises a proteinaceous pesticidal material
- obtainable from a Xenorhabdus species, or a pesticidal fragment thereof, or a pesticidal variant or derivative of either of these,

having in each case toxic activity when administered orally.

- A composition according to claim 1 wherein the said pesticidal material comprises material encoded by the nucleotide sequence of Figure 2 or variant or fragment thereof, or a sequence which hybridises with said sequence.
  - A composition according to claim 1 or claim 2 which comprises cells of Kenorhabdus.
  - claim 1 A composition as claimed in any one preceding claims which comprises supernatant taken from cultures of cells of \Xenorhabdus species.
  - A composition according to any one of the preceding claims wherein the Xenorhabdus species is Xenorhabdus
- 25 nematophilus.
- cla:m A composition according to wherein the Xenorhabdus species is ATCC 19061, NCIMB 40886 or NCIMB 40887.
- claim 1 A composition as claimed in claims which comprises a further pesticidal material not α, obtainable from Xenorhabdus.
  - 35 8. A composition according to claim 7 wherein the said further pesticidal material comprises a material obtainable from B. thuringlensis.

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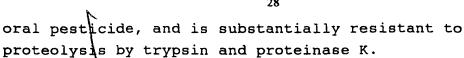


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- 9. A composition according to claim 8 which further comprises dells of B. thuringiensis.
- 10. A composition according to claim 8 wherein the pesticidal materials obtainable from B.thuringiensis comprises the delta endotoxin.
  - 11. A composition according to any one of the preceding claims which further comprises an agriculturally acceptable carrier.
    - 12. A composition according to claim, 10 wherein the carrier comprises items of insect diet.
- 13. A method for killing or controlling insect pests, which method comprises administering to a pest or the environment thereof a composition according to any one of the preceding claims.
  - 14. A method as claimed in claim, 12 wherein the pests are insects from the order Lepidoptera or Diptera.
  - 15. A microorganism comprising Xenorhabdus strain NCIMB 40886.
  - 16. A microorganism comprising Xenorhabdus strain NCIMB 40887.
- 17. A pesticidal agent which comprises a a toxin
  30 comprising a protein which is encoded by DNA which
  includes SEQ ID No. 1 or a variant or fragment thereof.
- 18. An isolated pesticidal agent characterised in that it is obtainable from cultures of X. nematophilus or mutants thereof, has oral pesticidal activity against Pieris brassicae, Pieris rapae and Plutella xylostella, is substantially heat stable to 55°C, is proteinaceous, acts synergistically with B. thuringiensis cells as an

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- 19. An isolated pesticidal agent as claimed in claim 18 further characterised in that the pesticidal activity is substantially destroyed by treatment with sodium dodecyl sulphate or acetone or heating to 80°C.
- 20. An isolated pesticidal agent as claimed in claim 18 10 -or claim 19 further characterised in that the agent is an extracellular protein.
  - A recombinant DNA which encodes a pesticidal agent claims 17 to 20. according to, ar
  - A recombinant DNA of claim 21 which comprises the sequence of Figure 2 or a variant or fragment thereof.
- A recombinant \DNA which comprises or hybridises under stringent conditions with all or part of the sequence of Figure 2, and which encodes a pesticidal material.
  - An expression vector comprising a recombinant DNA according to any one of claims 21 to 23.
  - A host organism which has been transformed with an expression vector according to claim 24.
- 30 26. A host organism as claimed in claim 25 which has been engineered or selected sudh that it also expresses other pesticidal proteinaceous toxicity enhancing materials
- 27. A host organism comprising a nucleotide sequence coding for a fusion protein \comprising a pesticidally 35 active portion of an agent as claimed in any one of o claims 17 to 20 in combination with other pesticidal  $\alpha$ proteinaceous toxicity enhancing materials.

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28. A host organism as claimed in claim 27 wherein the pesticidal toxicity enhancing materials comprise delta-endotoxin from B. thuringiensis.

5 **6**-- 29. A host organism as claimed in any one of claims 25 to 28 wherein the host is a plant.

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30. A host organism as claimed in any one of claims 25 to 28 wherein the host is a virus pathogenic to insects.

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31. A fusion protein as expressed by a host as claimed in claim 27.

32. A pesticidal composition comprising one or more agents as claimed in any one of claims 17 to 20.

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